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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
PAYNE, DAVID C	

ART UNIT	PAPER NUMBER
2613	

DATE MAILED: 05/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/020,310	SCHWENGLER, THOMAS	
	Examiner	Art Unit	
	David C. Payne	2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 February 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *9-17,20,21 and 25-27* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *9-13, 16, 17, 20, 21, 25-27* is/are rejected.

7)☒ Claim(s) *14 and 15* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Allowable Subject Matter

1. The indicated allowability of claims 9-15 and 25 are withdrawn in view of the newly discovered reference(s) to Paoli and Riza. Rejections based on the newly cited reference(s) follow.

2. Claims 14 and 15 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 9-13, 16, 17, 20, 21, 25-27 are rejected under 35 U.S.C. 102(b) as being anticipated by Paoli US 5,995,267 (Paoli).

   Re claim 9-13, 16, 17, 20, 21, 25-27 Paoli disclosed

   Time division multiplexing or time multiplexing is a method of obtaining a number of channels over a single optical pulse signal by dividing the optical pulse signal into a

number of time slots and assigning each channel its own intermittently repeated time slot within a duty cycle. Synchronizing information is added to define the starting and ending time of a slot within the duty cycle. An address is added to identify the time slot. Then the data signal stream from the different channels are put into the time slots and the optical pulse signal is transmitted. The signal is separated at the receiving end where each channel is reassembled Thus, more than one signal can be sent over a single channel by using different time intervals for the different signals. A perspective, schematic view of the basic raster output scanner 100 as used in the illustrated embodiments of the present invention is described with reference to FIG. 1. Raster output scanner 100 includes an electronic signal multiplexer 102 for inputting a time division multiplexed signal to a laser source 104 that outputs multiple, time division multiplexed signal modulated laser beams 106 (two beams shown in FIG. 1) from a substantially common spatial location. For purposes of clarity, only the chief rays are shown. Each beam is independently modulated from the electronic signal multiplexer 102 with data appropriate to expose a photoreceptive element in accordance with a desired image. An input optical system 108 serves to direct laser beams 106 onto overlapping coaxial optical paths such that they illuminate a rotating polygon 110 having a plurality of facets 112. The rotating polygon 110 repeatedly and simultaneously deflects the laser beams in the direction indicated by the arrow 116. The deflected laser beams are input to a single set of imaging and correction optics 118, which focus the laser beams onto the

photoreceptor 120 and correct for errors such as polygon angle error and wobble. For example, col. 2/lines 3/55 – 4/20, Fig. 2.

5. Claims 9-13, 16, 17, 20, 21, 25-27 are rejected under 35 U.S.C. 102(e) as being anticipated by Riza US 6,687,036 B2 (Riza).

Re claim 9-13, 16, 17, 20, 21, 25-27 Riza disclosed

An embodiment of the invention (see FIG. 1A) is a multi-dimensional optical scanning technique based on fiber-based wavelength division multiplexed (WDM) technology. This scanner can provide a large field of view (e.g., up to 360.degree.), a large scanning volume, a fast scanning speed, and the ability to scan a complicated three-dimensional (3-D) geometry. WDM devices have been recently used in telecommunication optical networks. Commercial availability of very high density WDM devices with 132 or more channels at a 50 GHz spacing have become a reality (see J-P Laude, K. Lange, ",Dense WDMs and routers using diffraction gratings," NFOEC'99, p.83, Chicago, Ill., 1999). In a 1:N WDM demultiplexer device, light in the input fiber channel containing N wavelengths is split into N independent fiber channels using an optical dispersion technique. Possible dispersive elements can include wavelength sensitive angularly multiplexed holograms, integrated-optic arrayed waveguide gratings (AWGs), bulk-optic interference-film filters, photonic

crystals, solid optic prisms, micro-machined Fabry-Perot filters, and fiber-Bragg grating devices. A variety of wavelength bands are possible, including the visible band using visible WDM devices. As we tune or select the wavelength of the light beam input to the demultiplexer, light is emitted from the appropriate fiber channel, and an optical scanner is realized.

The basic structure of a fiber-based W-MOS or .lambda. scanner is shown in FIG. 1A. In one design, a tunable laser 12 is connected to a 1:N WDM device 14 via a single mode fiber (SMF) 16. The demultiplexer 14 has N output channels, whose working wavelengths are .lambda..sub.1.lambda..sub.2.lambda..sub.N. Only laser beam of wavelength .lambda..sub.i can pass through the ith fiber channel. These ports are further connected to N beamforming elements (BFEs) 18 via optical fibers 20. The BFE can be fixed such as a bulk lens, or a planar diffractive optical element (DOE) such as a grating, or Fresnel lens. Another option for the BFE is a MEMS-based micromirror scanner, such as a 2-axis tilt mirror as shown in FIG. 1C or a deformable mirror chip as shown in FIG. 1D, although this results in part of the overall scanner having moving parts. The BFE can also be an optically or electrically programmable optical element, such as a liquid crystal beam steerer as shown in FIG. 1E. For instance, a BFE can focus the beam on the surface of an object. On the other hand, it can scan small angles to interconnect the 3-D scan space. A significant advantage of this optical scanner is its flexibility as the scanning profile can be adjusted according to the configuration of the object. This scanner can realize one-dimensional (1-D), two-dimensional (2-D), and 3-D scanning by

controlling the fiber port positions and the orientations of the BFEs. The speed of the scanner is based on the tuning speed of the tunable laser 12 or wavelength selective filter 22. Recently a wavelength switching time of 25 ns has been reported in a sampled-grating DBR laser over a 44 nm bandwidth (see B. Broberg, P-J Rigole, S. Nilsson, M. Renland, L. Anderson, "Widely tunable semiconductor lasers," IEEE LEOS Annual Mtg, p.151, December 1998). The W-MOS also provides simultaneous multiple beam generation capability via multi- lambda drive by electrically driving the optical filter with multiple electrical signals corresponding to simultaneously selected multiple wavelengths. Using a circulator, a reflective architecture is also possible for the scanner. As shown, the optical source can be laser 12 or filter 22. Use of filter 22 requires a broadband optical source 24. For 3-D measurement, the optical signals reflected at each BFE 18 is returned through multiplexor 14. The reflected signals are then coupled through an optical circulator 26 and passed to a detector 28. Fig 1A, Col./lines: 13/14-67.

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to David C. Payne whose telephone number is (571) 272-3024. The examiner can normally be reached on M-F, 7:00a - 4:30p.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (571) 272-3022. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Dcp

David Payne

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Primary Examiner
AU 2613